STS-XX Familiarization Briefing

PAYLOAD NAME AND ACRONYM

Presenter Name

Customer Organization
and location

Presentation Date

Organizational Structure

Name the organizations sponsoring and manufacturing the payload

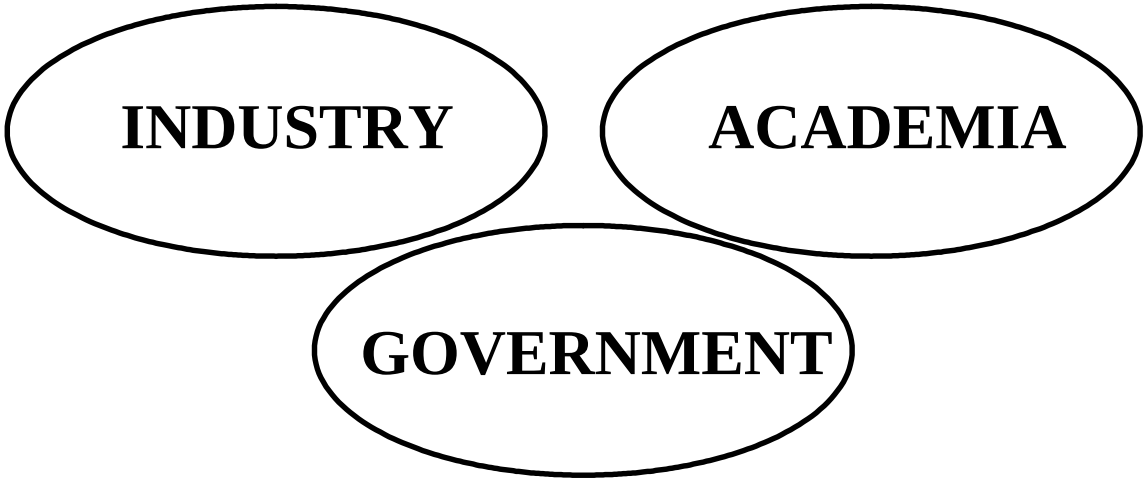
Show a basic organization chart

Customer Points of Contact

Name payload points of contacts
Payload Developers
Experiment Integrators
Safety / Testing
Mission Operations
NASA Operations Counterparts

Include Address, Telephone and E-mail

Primary Goals of Customer



- Promote the payload goals and objectives
- Name the benefactors and how they benefit from mission success
- Summarize the science or engineering principles of the payload
- Provide unique educational, manufacturing and medical benefits
- Provide benefits back to NASA

Payload Science

- Give a basic review of the payload science:
    - Biotechnology / Bioprocessing
    - Biomedicine / Pharmaceutic
    - Agriculture / Environmental
    - Manufacturing / Applied Technologies
    - Space Exploration / Hardware Development
- Explain why you are using the Shuttle to conduct these experiments
- Describe results from previous missions
- Support Mission Planning, Launch Preparation and Post-Flight Analysis

Benefits Derived

- Interdisciplinary Education - Unique, Blend of Engineering and Life Sciences
- Substantial Interaction with Industry in R&D Projects
- Space Flight Research Opportunities
- Involvement with Space Flight Hardware Design and Fabrication
- Space Flight Operation Hands-On Experience
- Specialized Courses Taught by Faculty Members

  - *Space Life Sciences*
  - *Space Habitation*
  - *Life Support and Biospherics*

Customer Flight Activity to Date (xx/xx/xxxx)

- Parabolic Flight - xx Flights
  KC-135
- Sounding Rockets - Missions
- Expendable Launch Vehicles
- Space Shuttle Flights
  xx Shuttle Sortie Missions
- International Space Station

Payload Flight History

- 11 Missions to Date STS-50, 54, 57, 60, 62 (for example)
- Total Science Returned Whatever units may apply
- In-Flight Anomalies This is important information also
  - What may have occurred
  - What corrective steps have been taken

Payload Interfaces with Orbiter

Picture or illustrate payload in Orbiter Configuration

Describe Stowage Requirements

Payload Interfaces with Orbiter

- Mechanical and Structural Interfaces
- Power Sources
- Communications Interfaces
- Control and Display
- Data Recording

MCC Interfaces with Payload

- **Show MCC interfaces with your payload control center**

- **Describe command and telemetry interfaces between NASA, MCC and payload communications networks and diagram Voice interfaces**

System Overview

- Temperature Control
  - Temperature Set Point: 4 - 37º C (example)
  - Detail method of control
- Operations
  - Flight Phases
  - Experiment Activation / Termination Control
- Safety Hazards
  - Levels of Sample Containment Achievable
  - Maximum Hazard Level

- Constraints / Flight Rules

Thermal Control Subsystem (example)

- Uses 3 Solid State Peltier Devices to Control Temperature Profile
- Liquid (Water) and Air Heat Exchangers
- Liquid Coolant Circulation System
- Heat Rejection Path and Heat Transfer Mechanism

GAP's (samples) → Internal Volume: Conduction / Surface Contact

Internal Volume → Coolant Loop: Water

Coolant Loop → Air Heat Exchanger: Peltier Devices

Air Heat Exchanger → Cabin: Forced Air (Fan)

- Out of Range Temperature Protection
  - Active / Computer Control / Solid State Temperature Sensors

- Passive / Bi-Metalic Switches against freezing / over-temperature

Mechanical / Electrical Interfaces (example)

- Power (28 Vdc)
  - 50 W baseline (each locker)
  - 200 W average, 270 W peak (total, all 3 lockers)
- Duty Cycle
  - Ambient Temperature and Set Temperature Profile Dependent
- Mass
  - 64 lbs max each locker insert
- Volume
  - ~ 2 cu ft each locker insert
- Touch Temperature Limits

- Will Not Exceed: 45º C surface / 49º C exhaust air

CREW TRAINING

- Summarize requirements for crew training sessions beyond FAM
  - Note the hours required for each session, type of session and objectives
- Emphasize what training is mandatory, highly desired and nice-to-know
  - Include training locations, procedures and hardware to be utilized
- Encourage crew participation and opportunities for preflight exposure and experience

with flight hardware or training equivalents

Operations (example)

Nominal Procedures

- Status Check / Clean Air Inlet
- Activate Habitat
- Connect Video
- Disconnect Video

Malfunctions

- Incorrect / No Display
- Incorrect Temp

Alternate Procedures

- Adjust Set Temp
- Adjust MET
- Adjust EOM
- Set Clock
- Reconfigure Habitat

IFMs

- No IFMs

Payload FAM Summary

- The Science
- The Uses
- Payload Description
- Orbiter Interfaces
- Operations and Procedures
- Crew Training